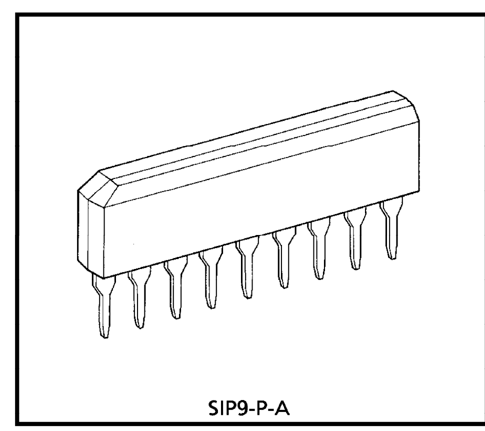
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT

TA7358AP

SILICON MONOLITHIC

FM FRONT-END

The TA7358AP is designed for a FM front-end application, which is suitable to a portable radio or a radio cassette.
Comparing with conventional types, supply voltage dependence, overload characteristics and spurious radiation characteristics are improved.

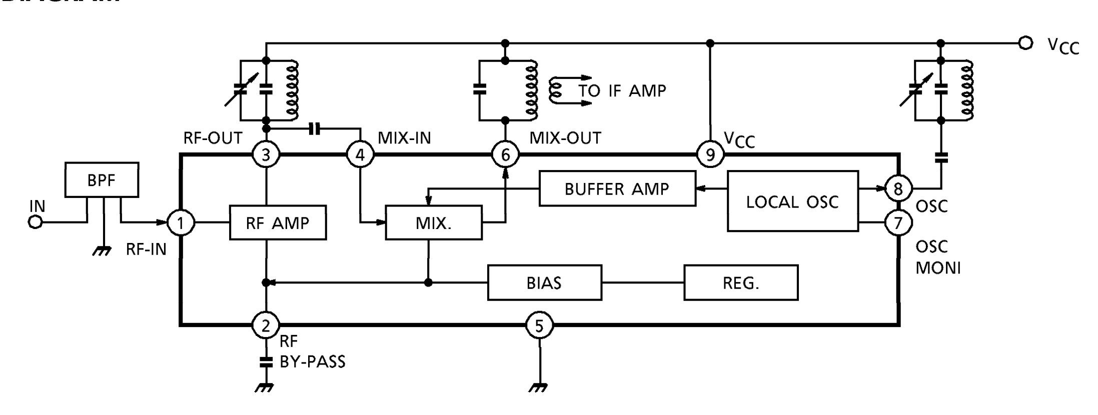


Weight : 0.92g (Typ.)

FEATURES

- Wide supply voltage range : $V_{CC} = 1.6\sim6.0V$
- Excellent supply voltage dependence of local oscillator : Oscillation stop $V_{CC} = 0.9V$ (Typ.)
- Improved inter-modulation characteristics by double balanced type mixer circuit.
- Low spurious radiation.
- Built-in clampping diode for the local oscillator output.

BLOCK DIAGRAM



EXPLANATION OF TERMINALS (Terminal voltage is DC voltage at Ta = 25°C, V_{CC} = 5V, and no signal)

PIN No.	SYMBOL	INTERNAL	TERMINAL VOLTAGE (V)
1	FM-RF IN	(diagram: pins 3, 1, 5 GND, 2; BIAS; 1kΩ)	0.8
2	BY PASS		1.5
3	FM-RF OUT		5.0
4	MIX IN	(diagram: pins 6, 9 V_{CC}, 4, 5 GND)	1.5
5	GND	—	0
6	MIX OUT	cf. pin ④	5.0
7	OSC MONITOR	(diagram: pins V_{CC} 9, 8, 7, GND 5)	4.3
8	OSC		5.0
9	V_{CC}	—	5.0

MAXIMUM RATINGS (Ta = 25°C)

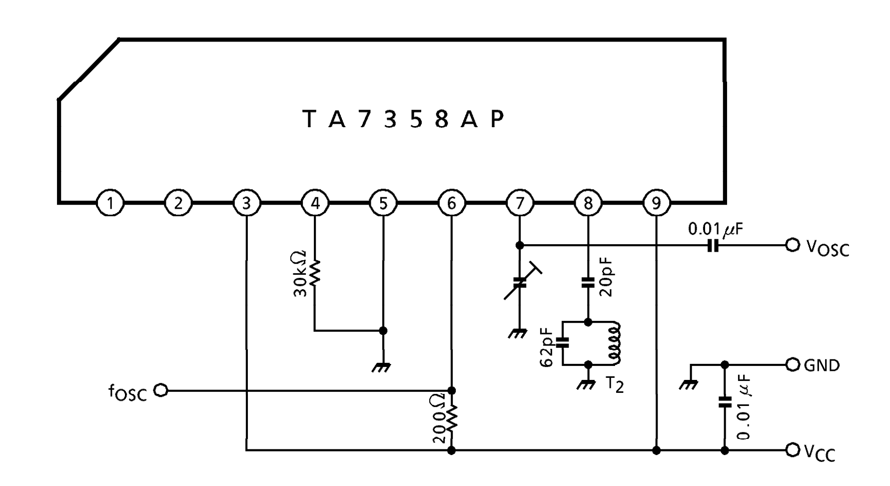
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	8	V
Power Dissipation	P_D (Note)	500	mW
Operating Temperature	T_{opr}	−25~75	°C
Storage Temperature	T_{stg}	−55~150	°C

(Note) Derated above 25°C in the proportion of 4mW / °C.

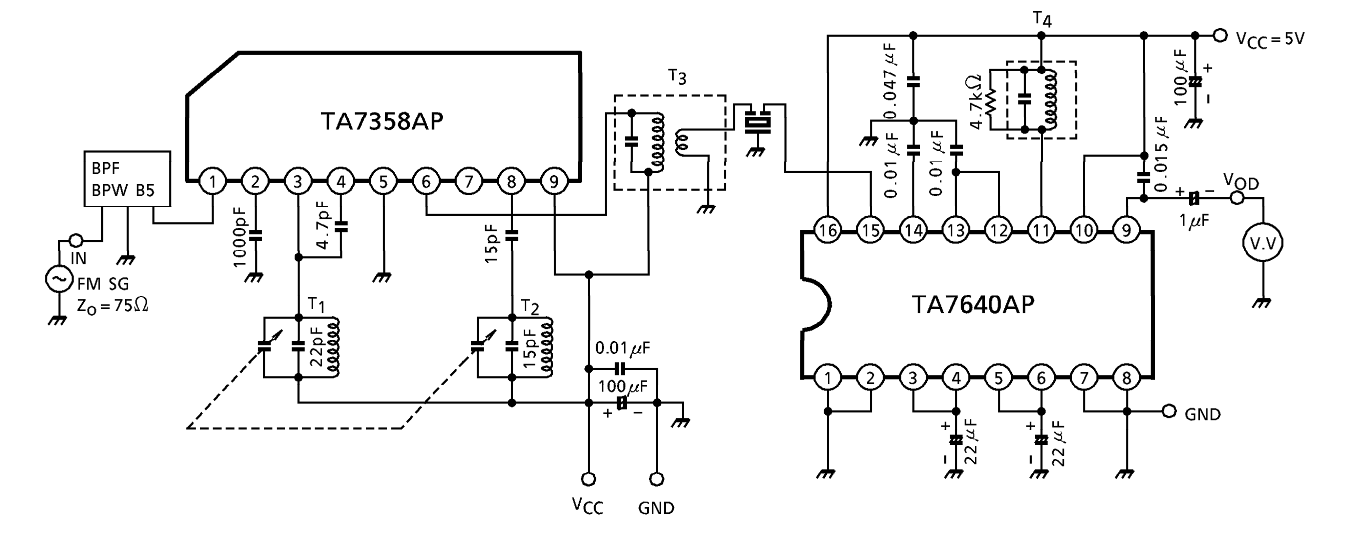
ELECTRICAL CHARACTERISTICS (V_{CC} = 3V, f = 83MHz, f_m = 1kHz, Δf = ±22.5kHz, Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current		I_{CC}	2	V_{in} = 0	—	5.2	8.0	mA
−3dB Limiting Sensitivity		$V_{in\ (lim)}$	2	—	—	3.0	7.0	dBμV EMF
Quiescent Sensitivity		Q_S	2	—	—	11.0	—	dBμV EMF
Conversion Gain		G_C	—	—	—	31	—	dB
Local OSC Voltage		V_{OSC}	1	f_{OSC} = 60MHz	90	165	220	mV_{rms}
Pin ① Impedance	Parallel Input Resistance	r_{ip1}	3	f = 83MHz	—	57	—	Ω
Pin ③ Impedance	Parallel Output Resistance	r_{op3}	3		—	25	—	kΩ
	Parallel Output Capacitance	c_{op3}			—	2.0	—	pF
Pin ④ Impedance	Parallel Input Resistance	r_{ip4}	3		—	2.7	—	kΩ
	Parallel Input Capacitance	c_{ip4}			—	3.3	—	pF
Pin ⑥ Impedance	Parallel Output Resistance	r_{op6}	3	f = 10.7MHz	—	100	—	kΩ
	Parallel Output Capacitance	c_{op6}			—	4.8	—	pF
Local OSC Stop Voltage		V_{stop}	1	—	—	0.9	1.3	V

TEST CIRCUIT 1



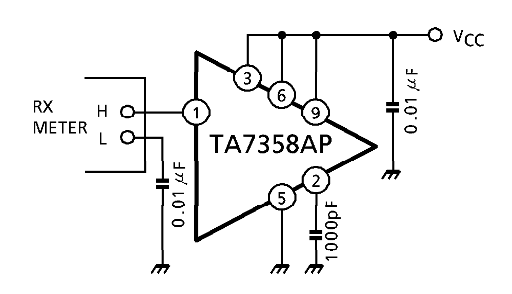
TEST CIRCUIT 2



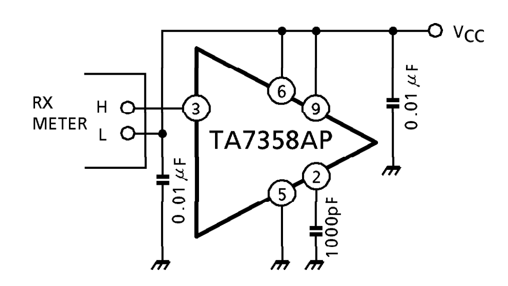
TEST CIRCUIT 3

Input output impedance

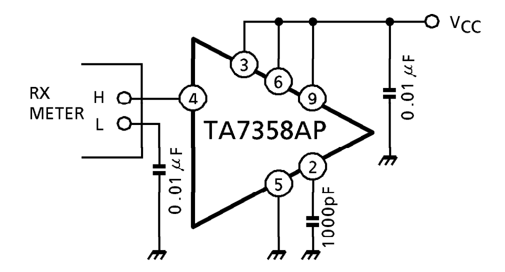
(1) r_{ip1}, c_{ip1}



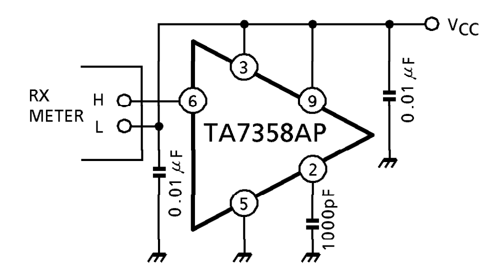
(2) r_{op3}, c_{op3}



(3) r_{ip4}, c_{ip4}



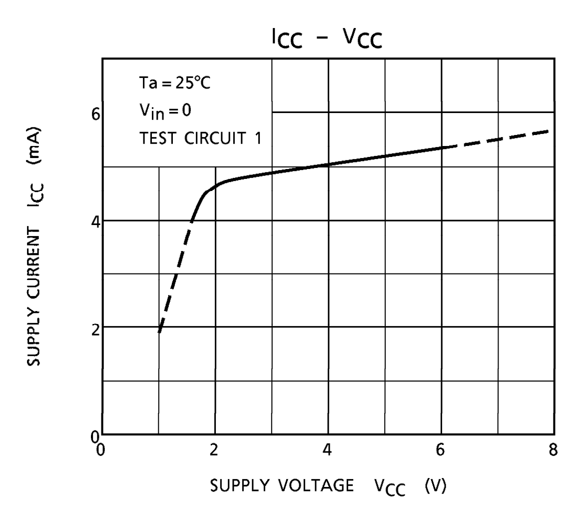
(4) r_{op6}, c_{op6}

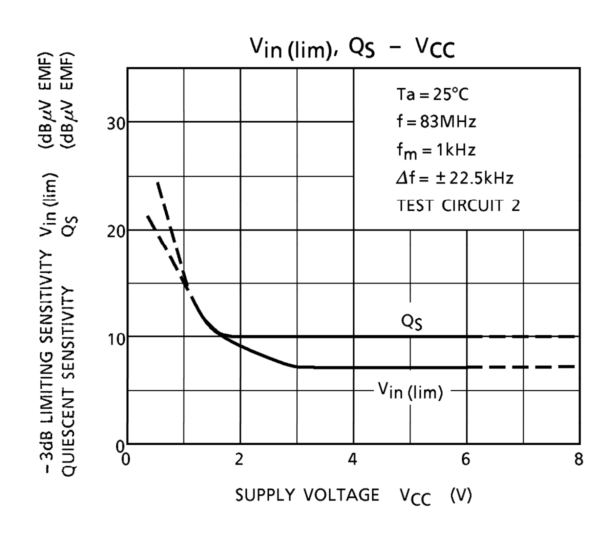


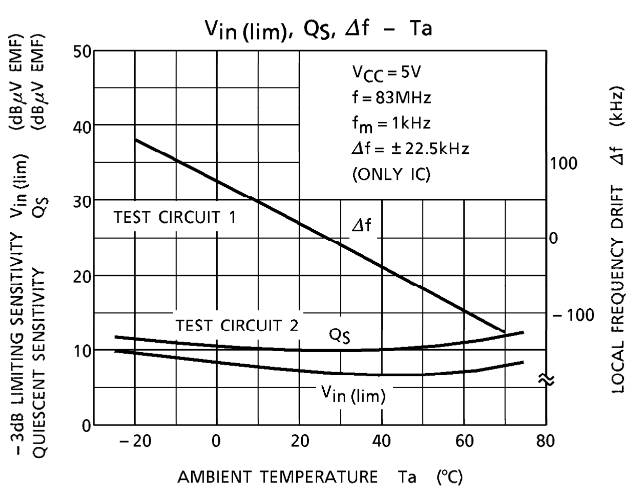
TEST CIRCUIT COIL DATA (Japan band for 76.0MHz to 108.0MHz)

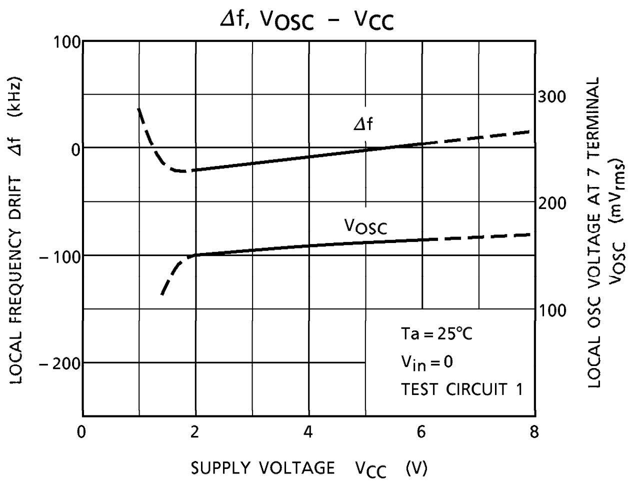
COIL	f_o	Q_o	TURNS	CAPACITANCE	
T_1 RF Coil	100MHz	100	0.5mmϕ $2\frac{1}{4}$T Center Tap (Japan Band)	15pF (External)	FERRITE CORE
T_2 OSC Coil	100MHz	100	0.5mmϕ $2\frac{1}{2}$T (Japan Band)	15pF (External)	FERRITE CORE
T_3 IFT Coil	10.7MHz	115	①-③ 12T ④-⑥ 1T Wire 0.12mmϕ UEW SUMIDA ELECTRIC Co., LTD. 5764 or equivalent	75pF	V_{CC} ③ ④ ② Pin ⑥ ① ⑥ (BOTTOM VIEW)
T_4 Quad Coil	10.7MHz	150	④-⑥ 14T Wire 0.12mmϕ UEW SUMIDA ELECTRIC Co., LTD. 44M-933A or equivalent	47pF	③ ④ ② ① ⑥ (BOTTOM VIEW)

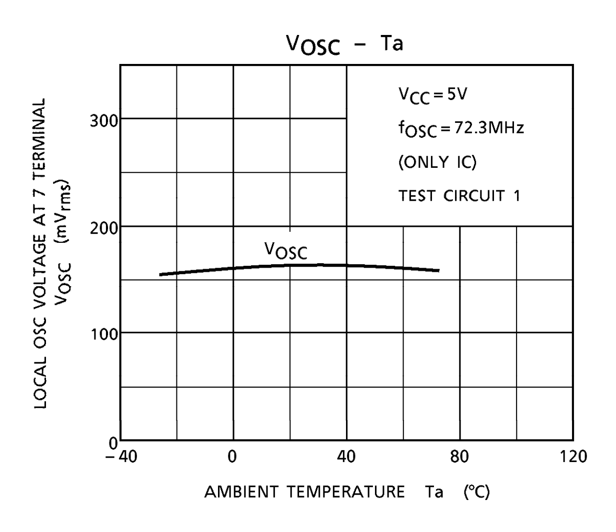
Band Pass Filter (BPF)
SOSHIN ELECTRIC Co., LTD. BPWB5
Tuning Cpacitor
ALPS ELECTRIC Co., LTD. CB41EL933


ICC – VCC
Ta = 25°C
Vin = 0
TEST CIRCUIT 1
SUPPLY CURRENT ICC (mA)
SUPPLY VOLTAGE VCC (V)


Vin (lim), QS – VCC
Ta = 25°C
f = 83MHz
fm = 1kHz
Δf = ±22.5kHz
TEST CIRCUIT 2
QS
Vin (lim)
–3dB LIMITING SENSITIVITY Vin (lim) (dBμV EMF)
QUIESCENT SENSITIVITY QS (dBμV EMF)
SUPPLY VOLTAGE VCC (V)

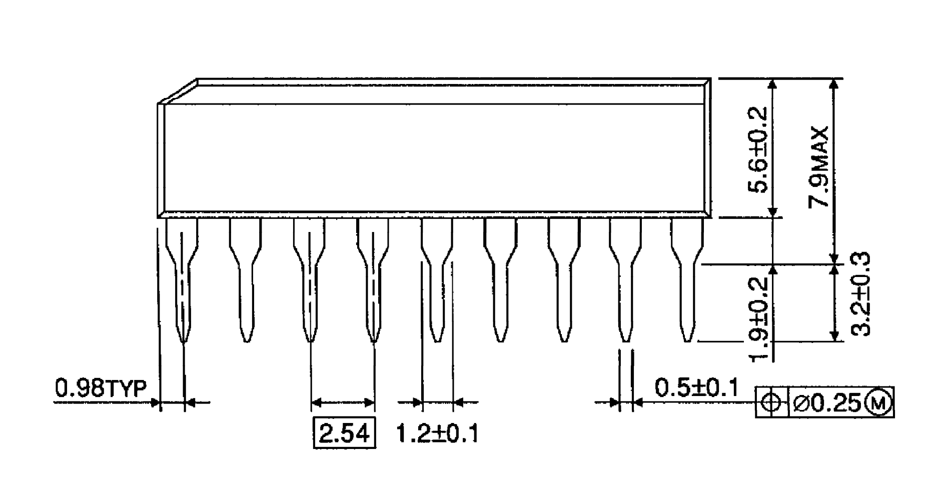

Vin (lim), QS, Δf – Ta
VCC = 5V
f = 83MHz
fm = 1kHz
Δf = ±22.5kHz
(ONLY IC)
TEST CIRCUIT 1
Δf
TEST CIRCUIT 2
QS
Vin (lim)
–3dB LIMITING SENSITIVITY Vin (lim) (dBμV EMF)
QUIESCENT SENSITIVITY QS (dBμV EMF)
LOCAL FREQUENCY DRIFT Δf (kHz)
AMBIENT TEMPERATURE Ta (°C)

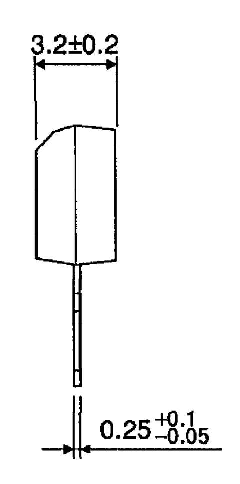

Δf, VOSC – VCC
Δf
VOSC
Ta = 25°C
Vin = 0
TEST CIRCUIT 1
LOCAL FREQUENCY DRIFT Δf (kHz)
LOCAL OSC VOLTAGE AT 7 TERMINAL VOSC (mVrms)
SUPPLY VOLTAGE VCC (V)

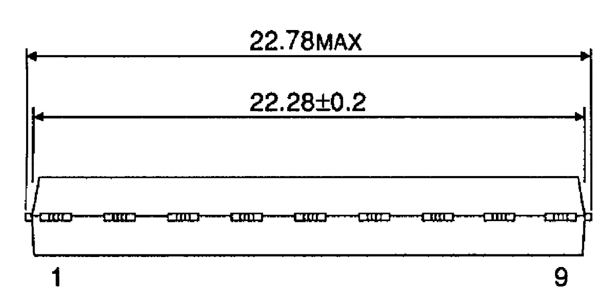

VOSC – Ta
VCC = 5V
fOSC = 72.3MHz
(ONLY IC)
TEST CIRCUIT 1
VOSC
LOCAL OSC VOLTAGE AT 7 TERMINAL VOSC (mVrms)
AMBIENT TEMPERATURE Ta (°C)

OUTLINE DRAWING
SIP9-P-A

Unit : mm







Weight : 0.92g (Typ.)